



# The smell of success

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*Mating disruption helps augment a multi-pronged attack on vine mealybug*

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**Editor**

Mating disruption, which California stone fruit growers have adopted widely, shows similar promise as part of an integrated approach to control vine mealybug in grapes.

As in stone fruit, the technology—which is based on a female insect scent, or pheromone—shouldn't be viewed as a stand-alone control, says Kent Daane, an Extension biological control entomologist based at the University of California's Kearney Agricultural Center near Parlier. Instead it should be part of a multi-pronged program.

The theory behind mating disruption is to inundate an area with so much synthetic female insect scent that males become confused and have a hard time locating females with which to mate. If females don't mate, they typically won't reproduce.

For mating disruption to work best, vine mealybug populations must be low to moderate, says Walt Bentley, an Extension integrated pest management specialist based at the Kearney Agricultural Center.

That may mean reducing mealybug populations with insecticides before or in conjunction with mating disruption.

## **A brief life history**

Since vine mealybug was first confirmed in 1994 in Riverside County, it has spread throughout the state's grape-growing regions.

“It's moving really rapidly throughout the state, and it's not simply mechanical transmission or by people,” Bentley says.

Vine mealybug overwinter on grapevine roots and under the bark on the lower trunks. As spring temperatures warm, they move up to the canes, leaves and eventually the bunches. The goal is to control them before they've moved into the clusters.

Because vine mealybug may be hard to spot, growers should look for signs of the pest, such as foraging ants, honeydew or wet bark, or white wax protruding from beneath the bark.

Typically, growers or vineyard workers first notice an infestation around harvest time, Daane says.

### **Dispensing control**

Daane has been looking at mating disruption as part of an integrated vine mealybug control program for at least five years. The pheromone dispensers have evolved over that time to where they resemble the foil and membrane ones used in stone fruit and walnuts.

The synthetic pheromone, which is dispensed through the CheckMate® membrane system from Suterra LLC of Bend, Ore., was used in California under a Section 18 registration on about 6,000 acres of grapes in 2008. Daane says he hopes the Environmental Protection Agency will again grant a Section 18 for the product's use this season.

Early in the season before biofix, workers hang the dispensers at a rate of about 250 per acre on the trellis wires, says Carlos Reyes, Suterra director of technical sales support based in Auburn, Calif.

The current ones were designed for hanging on thumb-size diameter tree Mating disruption, which California stone fruit growers have adopted widely, shows similar promise as part of an integrated approach to control vine mealybug in grapes.

The current ones were designed for hanging on thumb-size diameter tree limbs or cordons, but Reyes says Suterra is working on a dispenser hook that is more suited to hanging on trellis wires.

Because the pheromone emitted by the dispensers essentially shuts down vine mealybug monitoring traps, growers will have to check for visual symptoms to make sure populations are not getting out of hand, Daane says.

The pheromone dispensers typically last up to 160 day, Reyes says.

And like mating disruption programs in other commodities, the one in grapes works better if growers apply it to 40 or more contiguous acres, he says.

### **Mating disruption vs. conventional insecticides**

Although Daane doesn't recommend using mating disruption as a stand-alone treatment, his trials compared it to an insecticide treatment.

"In our studies in one year of applying them, we were getting about a 40 to 50 percent knock down and about a 70 percent reduction of the damage compared to the standard one-spray control," Daane says.

Applaud insecticide combined with mating disruption provided better control than Applaud alone, he says.

With high vine mealybug populations, a program that involved Lorsban and Movento insecticides or Movento and Applaud provided better control than mating disruption alone, Daane says.

Much of his preliminary work was conducted with winegrape growers. Daane had trials for the first time in table grape vineyards during 2008, and he says he needs another year of data before drawing conclusions.

### **Technology worked better than expected**

Erin Amaral, a viticulturist with Pacific Vineyard in San Luis Obispo, Calif., has been a cooperator in Daane's trials for the past four years.

Initially, she liked the theory of phasing out the use of organophosphates and taking a more sustainable approach to winegrape production.

Now that she's had a couple of years' experience with the technology, she says she's even more excited about its prospects.

"I have a better grasp on it now, and I really, really like what it's doing," Amaral says.

Depending on the infestation levels, Amaral says she has used several different reduced-risk control measures combined with mating disruption.

In some of the blocks, Amaral also is working with Monica Cooper, a staff research associate with Daane's group, to release the minute *Anagyrus pseudococci* wasp. The parasitoid of vine mealybug was originally imported from Africa and Europe.

"They've definitely helped bring the population down," Amaral says.

Some of the unknown questions are how well will the insects overwinter, what is their survival rate in the vineyard and will they naturally spread?

Even when vine mealybug populations are reduced, Amaral says she believes she'll need to continue to use mating disruption as part of a maintenance program.

"This isn't a pest we can eradicate," she says. "This is a pest we're learning to live with. We're trying to do whatever we can to prevent it from spreading."

### **Treading softly**

In the past, growers with high vine mealybug pressure typically used Lorsban insecticide to reduce the pest numbers. But Walt Bentley, a University of California Extension integrated pest management specialist, says his field trials have shown that growers can obtain similar control using reduced-risk products that do not contain organophosphates.

With the recent registration of Movento from Bayer CropScience, growers have another alternative post-harvest treatment. Movento is a systemic product that needs to be absorbed by the leaves to enter the vines. Because of that, it needs to be applied before the leaves have senesced, Bentley says.

In the spring the following year, growers can follow up with an application of Applaud, an insect growth regulator from Nichino America Inc., at budbreak in April or early May. An alternative treatment would be a systemic neonicotinoid, such as Venom or Admire, at bloom time.

A second application can be made later in the season before veraison, if needed.

“If you see anything coming onto the clusters, I’d apply a neonicotinoid to knock back the population that seems to be getting out of hand,” Bentley says. “I’d make my decision on just visiting a few locations. If I find just a few locations [with vine mealybug], I’d treat. You should be in there in late July or early August before veraison.”

Once the clusters have closed, vine mealybug can hide and are protected from contact with insecticides.